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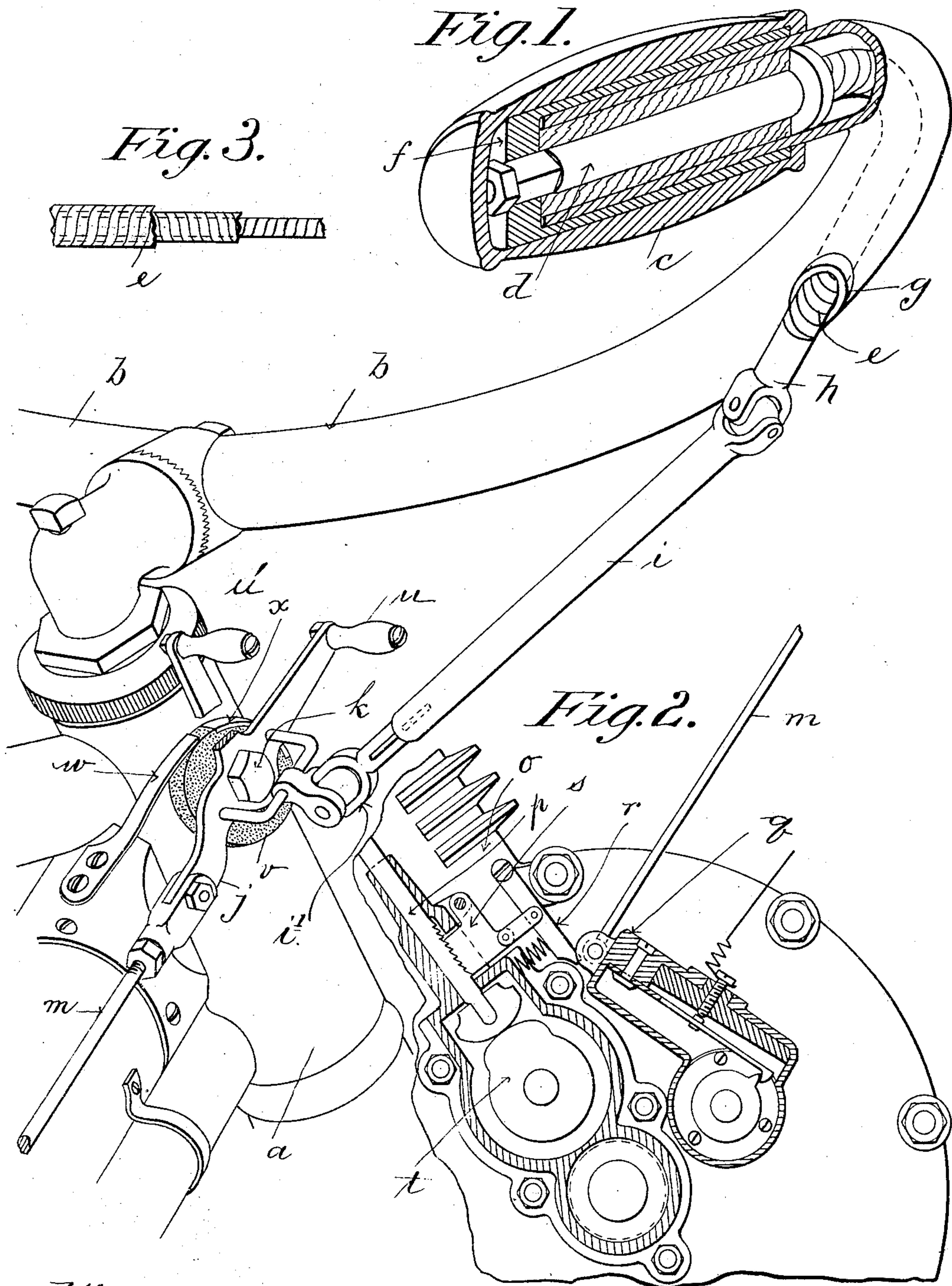
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GRIP OPERATED CONTROLLING MECHANISM FOR MOTOR CYCLES.

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NO MODEL.



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GRIP-OPERATED CONTROLLING MECHANISM FOR MOTOR-CYCLES.

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To all whom it may concern:

Be it known that I, CARL OSCAR HEDSTROM, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Grip-Operated Controlling Mechanism for Motor-Cycles, of which the following is a specification.

This invention relates to devices for controlling the motors of power-driven vehicles, and has special reference to the application of such devices to motor-cycles, though it is not necessarily confined in its use to this type of vehicle.

The object of the invention is to provide controlling means for the motor associated with the steering-handle of a power-driven vehicle, the construction being so arranged as to permit entire freedom of movement of the steering devices and the simultaneous operation of the motor-controlling devices without releasing the grasp on the steering devices.

A further object of the invention lies in the association with the motor-controlling devices of a switch located in the circuit between the battery and the motor and operated by the controlling devices of the latter at the limit of the movement of said controlling devices in one direction.

In the drawings forming part of this application, Figure 1 is a perspective view of a portion of a motor-cycle including one of the handle-bars, showing the application of this invention thereto, parts of the drawing being shown in section. Fig. 2 is a view of a portion of a motor-case, certain of the valve-operating parts and of the sparking mechanism being shown in section. Fig. 3 is a view of a portion of the flexible shaft forming part of the motor-controlling devices.

Referring to the drawings, *a* indicates the head of a motor-cycle frame, and *b b* the two handle-bars, the latter being connected in the usual manner to the front fork of the machine, (not shown,) whereby the latter may be steered. As usually constructed heretofore the devices for controlling the motor have been located on or near the head of the machine within convenient reach of the operator, and

it has been necessary for the latter to release his hold on one of the handle-bars to operate the controlling devices. Machines have been built, however, in which a switch has been operated by the rotation of the grip *c* on one of the handle-bars. By means of this invention both the control of the motor and the breaking of the sparking circuit may be effected by the rotation of the grip *c*.

The usual method employed to control motors of the internal-combustion type consists in opening either the inlet or the exhaust valve at the proper time to prevent the full compression of a charge of combustible or to restrict the admission of the combustible to less than a full charge. In the drawings devices are illustrated whereby the control is effected through the operation of the exhaust-valve, a connection extending from this valve up to the head of the frame and actuated by the rotation of the grip in the manner to be described. This valve-regulating mechanism, however, is only shown as a matter of convenience, and any other method of valve control may be substituted therefor which is capable of being actuated as this is through connections in the handle-bar which may be actuated without releasing the grasp on the latter.

In carrying this invention into practice the grip *c* is mounted to rotate on the end of the handle-bars and through the end of the latter is connected with a shaft *d*, to the inner end of which a flexible shaft *e* is secured. The grip *c* may be connected to this shaft in any suitable manner, a convenient way being shown in the drawings, which consists in sliding a shell *f* over the end of the handle-bar, which shell has a closed outer end through which the squared-off end of the shaft may be passed, and by means of a nut immovably securing said shell to the shaft the grip may then be secured to this shell to rotate therewith. To transmit rotative movements of the grip through the handle-bar, the flexible shaft *e* is located in the latter for a portion of its length, but emerges therefrom, as at *g*, Fig. 1, and to its outer end is secured the forked piece *h*. To this forked piece *h* is connected by a universal joint of which the piece *h* is

one of the parts the telescoping member i , which by means of a second universal joint i' is connected with an arm j , pivotally supported at k on the head a of the frame in such manner that said arm may be rotated in either direction by the rotative movements of the grip. The two parts of the telescoping member i have a sliding connection, one over the other, but rotate as one piece. This construction, together with the universal joint in the connection between the handle-bar and the arm j , permits the bar to be swung on its axis in the head a either way in a horizontal plane without in any way interfering with the rotation of the arm j by means of the grip c and the connections between it and said arm. One end of the arm j is connected pivotally with a rod m , the two parts of which are shown in Figs. 1 and 2. This rod extends to the motor and is at that point connected with suitable devices for controlling the degree of opening of a valve of the motor o . In this case, as stated above, the rod m operates to prevent the complete closing of the exhaust-valve, of which only the stem p is shown in the drawings. This is the same construction as is shown and described in my prior United States Letters Patent, dated May 12, 1903, No. 727,944, to which reference may be had, it being sufficient for the purposes of this application to state that the rod m is connected with the swinging member q , whereby the time of sparking may be varied relative to the degree of compression of the explosive element in the cylinder, and this compression is regulated by the movement of the member q toward and from a short arm r , connected with a latch s , having teeth thereon adapted to engage with similar teeth on the stem p of the valve, whereby the latter, whose opening movement is effected by the cam t , may be prevented from returning to its seat by the latch s , actuated by the movement of the rod m in one direction. It is thus apparent that by the rotation of the grip c in one direction the speed of the motor may be reduced to a minimum, and incidentally the time of sparking retarded proportionately to the decreasing power, and by the rotation of the grip in the other direction the valve of the motor will be permitted to open and entirely close on each stroke and coincidentally the time of sparking be advanced.

On that end of the arm j opposite to that with which the rod m is connected is a handle u , which may be operated to swing the lever j on its axis independently of the grip c , the latter and its connections being free to be rotated by the movement of the arm j , and another handle u' at right angles to the handle u may be located thereon, if desired.

While in the drawings the rod m is shown as operating a valve and a device for regulating the time of sparking, the latter device is not in all cases associated with the valve-oper-

ating mechanism, and the control of the motor may be effected by the operation of the valve alone, in which case the rod m would be connected directly to the arm r , and the motor might thus be controlled by the rotation of the grip c without effecting the time of sparking in any way. It is desirable, however, when the grip has been rotated far enough to reduce the speed of the motor to its lowest point that a further rotation thereof in the same direction should interrupt the spark-circuit, and thus bring the machine slowly to a stop. Therefore the disk v is mounted on the pivot k of the arm j to constitute in connection with a spring-finger w a switch whereby the spark-circuit may be broken. The switch is constructed as follows: In the periphery of the disk v , which is made of some insulating material, is a plate x , which extends partly around the disk. This plate is connected with one pole of a battery or other source of electricity, and the spring-arm w is connected with the opposite pole thereof. These electrical connections are neither of them shown.

When the parts are in the position shown in Fig. 1, it is the position they occupy when the motor is at rest, the spark-circuit being broken by the separation of the finger w , and the plate x and the rod m being thrust toward the motor to the limit of its movement, thus holding the valve on the stem p farthest away from its seat. If it is desired to stop the machine, the arm j may be operated by hand to release the valve held in open position by the rod m , and this movement will rotate the disk v and close the circuit which was interrupted by the separation of the parts x and w , as above set forth. If the machine is under way on the road and the grip c be rotated far enough to bring the parts to the position shown in Fig. 1, when it is desired to start the motor again the grip c may be turned to release the valve and complete the sparking circuit in the same manner as this operation may be accomplished by swinging the arm j by hand.

From the foregoing description it is evident that the operator of the machine has absolute control of the motor at all times and may either reduce the speed at will or stop the motor entirely and start it again without once taking his hand from the grip on the handle-bar. The necessity of removing the hand from the grip in order to control the machine, which heretofore has been necessary, has always been a serious disadvantage, especially to beginners, many of whom are timid about steering a machine with one hand as heavy as a motor-cycle going at the rate of speed these machines frequently attain, and many accidents have occurred because of the necessity of letting go of one of the handle-bars at an inopportune moment for the purpose of reducing speed.

It is desirable that there should be no lost motion between the grip and the rotatable

arm *j*, but that all movements imparted to the grip should be transmitted to the arm *j*, whereby the operator may always have absolute and close control of the motor. I attain this end 5 and still retain the spirally-wound flexible shaft *e* in the connection between the grip and the arm *j* by making this spirally-wound shaft in three parts, one inclosed within the other and illustrated in Fig. 3, the inner and 10 outer coils being wound in the same direction and the middle coil in an opposite direction, the opposite ends of each of these three constituent parts being secured, respectively, to the shaft *d* and to the member *h*. Thus whenever the 15 grip *c* is rotated in one direction the coils of the inner and outer members of this flexible shaft will be constricted and the middle one will be opened, thus interengaging and preventing any torsional movements. When the 20 grip is turned in the opposite direction, the effect is the same. This flexible shaft construction, however, forms no part of this invention.

Having thus described my invention, what 25 I claim, and desire to secure by Letters Patent of the United States, is—

1. In a motor-cycle comprising an explosion-engine, an electric igniting device therefor and regulating means for the engine; a 30 steering-handle, a grip axially rotatable thereon, a swinging member supported on a fixed part of the machine, and comprising a switch which forms part of the circuit of said igniting device, and a connection between said grip 35 and said swinging member whereby the rotation of the grip may effect the regulation of the motor, and the operation of the switch to make and break the igniter-circuit.

2. The combination with the steering-lever 40 of a motor-vehicle, of a rotatable member

mounted on the latter and comprising a switch for an electrical circuit; controlling mechanism for the motor, and a flexible and extensible connection between the grip on the steering-lever and said rotatable member, whereby 45 rotatory movements of the grip may impart like movement to said member and to said switch.

3. The combination with the steering-lever of a motor-vehicle, of a rotatable member 50 mounted on the latter and comprising a switch for an electrical circuit; a rotatable grip on said steering-lever; motor-controlling mechanism, and a connection between the latter and said member; a flexible shaft, as *e*, connected with 55 the grip, an extensible shaft connected at one end with the flexible shaft and at the opposite end with said rotatable member by universal joints, whereby the swinging movement of the steering-lever and rotatory movements of the grip and its connections may be 60 simultaneously effected.

4. The combination with the steering-lever of a motor-vehicle, of a rotatable member 65 mounted on the latter; a rotatable grip on said steering-lever; motor-controlling mechanism, and a connection between the latter and said member; a flexible shaft, as *e*, connected with the grip, an extensible shaft connected at one end with the flexible shaft, and at the opposite 70 end with said rotatable member by universal joints, whereby the swinging movement of the steering-lever and rotatory movements of the grip and its connections may be simultaneously effected.

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